

Transportation Research Board

Technical Activities Division
Committee Research Problem Statements

Group 2, Design and Construction of Transportation Facilities

Section A - General Design

Committee A2A04, Roadside Safety Features

Research Problem Statements

Preface

An important function of the Transportation Research Board (TRB) is the stimulation of research toward the solution of problems facing the transportation community. One of the techniques employed by technical committees in support of this function is the identification of problems, and the development and dissemination of research problem statements. The aim of this activity is to provide information to governmental agencies, research institutes, industry, the academic community and others in allocating scarce resources to the solution of transportation problems.

The problem statements listed below were developed by the TRB committee indicated above. Collectively they should not be considered an all inclusive recognition of research needs in the committee's technical area, but represent a portion of the overall needs identified by committee members. It is likely that some current research in progress or recently completed research was overlooked which may have altered the listings.

Statements

Problem Number	Problem Statements
1	Use of Event Data Recorder (EDR) Technology for Highway Crash Data Analysis
2	Develop New Approach Guardrail Transitions
3	Methods for Dealing with Crashes into Trees & Utility Poles
4	Review Effects of Side Slopes on Vehicles Leaving the Roadway
5	Better Roadside Safety Data and Integration
6	Crashworthiness of Portable Concrete Barriers
7	Improved Roadside Safety Management Systems

PROBLEM 1: USE OF EVENT DATA RECORDER (EDR) TECHNOLOGY FOR HIGHWAY CRASH DATA ANALYSIS

There is a critical need to correlate “real world” collision conditions to the probability of injury. There is currently a lack of reliable data upon which these relationships can be formulated. For the first time, it is now possible to capture vehicle dynamics data from the sensors provided to measure vehicular decelerations in determining when airbags should be deployed in the U.S. vehicle fleet. This technology has the capability to store pertinent vehicle dynamics information from airbag systems that have been deployed during a crash. Research is needed to capture this data and correlate it with other detailed accident injury information to provide a direct link between accident severity and surrogate occupant severity measures. The resultant measures will provide a basis for the development of better severity indices and lead to improved cost-effectiveness analyses.

Objective

The objectives of this research are to (1) formulate procedures for the capture and analysis of data for vehicle crashes from on-board vehicle sensors, (2) demonstrate the value of a database with this data appended, (3) establish recommendations for enhanced procedures.

Implementation

The automobile industry is installing advanced on-board sensors in new vehicles that will capture pertinent vehicle safety data.

These sensors can capture the vehicle speed at impact, lateral and longitudinal acceleration-time histories, principal direction of force on the vehicle, the status of braking, steering, seat belt usage, air bag deployment, and other valuable crash information. This development represents the “missing link” to the road safety community because it will finally provide the “real world” connection between idealized full-scale crash test results on roadside safety devices such as longitudinal barriers and crash cushions on the one hand and actual field performance on the other. The following tasks are proposed:

1. Summarize the status of EDR technology.
2. Determine the most critical crash data to be selected for recording.
3. Instigate the alternative means for capturing, storing, and retrieving the data.
4. Analyze the resulting data from the highway design perspective to determine relationships between design and safety.
5. Analyze the potential for capturing this data through the NASS program.
6. Analyze the data and document the findings in a final report.

Urgency

There is currently a lack of reliable data upon which the relationships between impact conditions and probability of injury can be established. Data from airbag crash sensors on vehicles, if available, could potentially provide valuable data over the long term. Comparative analysis of crash data for vehicles with and without airbags can provide important insights into the design of vehicles and roadside hardware. The relationships between impact conditions and probability of injury will be invaluable as inputs to cost-effectiveness analysis procedures.

Cost

\$250,000

Time

24 months.

Posting

4/31/2000 to 5/1/2003.